REMARKS/ARGUMENTS

Applicant has received the Office Action dated March 23, 2007 (hereinafter "Current Office Action"), in which the Examiner: 1) rejected claims 1-36 and 56-61 under 35 U.S.C. 103(a) as allegedly obvious over Wesinger, JR. et al. (U.S. Pat. App. Pub. No. 2001/0011304, hereinafter "Wesinger") in view of Rogers et al. (U.S. Pat. No. 5,701,451, hereinafter "Rogers"); 2) rejected claims 37-53 and 62-64 under 35 U.S.C. 103(a) as allegedly obvious over Wesinger in view of Doran ("Amdahl Multiple-Domain Architecture," hereinafter "Doran"); and 3) rejected claims 54 and 55 under 35 U.S.C. 103(a) as allegedly obvious over Wesinger in view of Stewart et al. ("The Motorola PowerPC TM PEEK profiler," hereinafter "Stewart"). No amendments are being presented with this response. Based upon the arguments contained herein, Applicant believes this case is in condition for allowance.

I. PROSECUTION HISTORY SUMMARY

Applicant respectfully notes that the subject application has undergone an unusually long and complex prosecution, and has been the subject of rejections based upon a significant number of cited references. Because of this history, and because some of the remarks and arguments presented herein make reference to this history, Applicant respectfully submits the following summary of the prosecution history (excluding minor objections and corrections) of the subject application, beginning with the First Office Action.

A. First Office Action (Mailed December 9, 2004)

In this Office Action (hereinafter "First Office Action"), the Examiner: 1) rejected claims 1-3, 10-11, 13, 18-22, 28-29, 31, 36-39, 45-46, 48 and 53-55 under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Pat. No. 6,075,938 (hereinafter "Bugnion") in view of U.S. Pat. No. 6,810,033 (hereinafter "Derks"); and 2) rejected claims 4-9, 12, 14-17, 23-27, 30, 32-35, 40-44, 47 and 49-52 under 35 U.S.C. § 103(a) as allegedly obvious over Bugnion in view of Derks, and

further in view of U.S. Pat. No. 6,697,824 (hereinafter "Bowman-Amuah"). Regarding independent claims 1 and 20, the Examiner acknowledged that Bugnion does not explicitly teach setting up for, and at the request of, each of a plurality of customers at least one virtual machine having a specification specified by each respective customer, but alleged that Derks teaches these claim elements. *See* First Office Action, ¶ 4, pp. 2-3. Regarding independent claim 37, the Examiner acknowledged that Bugnion does not explicitly teach operating plural virtual machines each having a specification specified by one of a respective plurality of customers in accordance with a computer service to be provided by the virtual machine on behalf of that customer. Again the Examiner alleged that Derks teaches these claim elements. See First Office Action, ¶ 4, pp. 3-4. Regarding independent claim 54, the Examiner acknowledged that Bugnion does not explicitly teach the at least one virtual machine having a specification determined in accordance with the computer service or services requested by said customer. The Examiner again alleged that these claim elements are taught by Derks. See First Office Action, ¶ 4, p. 4.

B. Response to First Office Action (Filed April 11, 2005)

In this response (hereinafter "First OA Response"), Applicant amended independent claims 1, 20, 37 and 54, and added new claims 55-64. Applicant noted, among other things, that Bugnion merely teaches software used to create virtual machines. Applicant further noted that Derks does not overcome the deficiencies of Bugnion already acknowledged by the Examiner in the First Office Action, and also that Derks does not even relate to virtual machines at all, instead relating to virtual private networks (VPNs). Additionally, Applicant provided an explanation of what a Virtual Machine is and how such virtual machines have historically been used.

C.   Final Office Action (Mailed July 22, 2005)

In this Office Action (hereinafter "Final Office Action"), the Examiner: 1) rejected claims 37-39, 45-46, 48, 53 and 62-64 under 35 U.S.C. § 102(e) as allegedly anticipated by U.S. Pat. No. 6,397,242 (hereinafter "Devine"); 2) rejected claims 40-44, 47 and 49-52 under 35 U.S.C. § 103(a) as allegedly obvious over Devine in view of Bowman-Amuah; 3) rejected claims 1-3, 10-11, 13, 18-22, 28-29, 31, 36, 54-55 and 56-61 under 35 U.S.C. § 103(a) as allegedly obvious over Bugnion in view of Derks; and 4) rejected claims 4-9, 12, 14-17, 23-27, 30, 32-35 and 40 under 35 U.S.C. § 103(a) as allegedly obvious over Bugnion in view of Derks, and further in view of Bowman-Amuah. The Examiner provided a brief explanation as to why she disagreed with Applicant's arguments, and thus why she continued to maintain the rejections of the First Office Action.

D.   Response to Final Office Action (Filed January 20, 2006)

In this response (hereinafter "Final OA Response"), Applicant filed a Notice of Appeal, presented additional remarks and arguments without amending the claims further, and submitted an Affidavit from the Inventor (hereinafter "Inventor Affidavit") in support of the arguments presented. Applicant reiterated that Bugnion teaches software (a virtual machine monitor) that creates and monitors virtual machines and does not teach one or more virtual machines that are set up for and configurable by each of several customers to provide computer services for the customers. Applicant also reiterated that Derks relates to VPN systems, a technology that is unrelated to virtual machine technology, and further submitted that the arguments presented by the Examiner regarding Derks did not support the Examiner's position. Applicant further noted that Devine discloses in essence the same subject matter as Bugnion, with the same deficiencies, and thus does not anticipate the subject application. Applicant further noted that because Devine does not anticipate the claims listed by the Examiner, Devine does not

provide a basis for the rejections of other claims rejected as allegedly obvious over Devine in view of additional cited art.

E.   Advisory Action (Mailed February 8, 2006)

In this Advisory Action (hereinafter "First Advisory Action"), the Examiner acknowledged receipt of the Notice of Appeal, reiterated her prior rejections and stated that the request for reconsideration did not place the subject application in condition for allowance, declined to enter the Inventor Affidavit, and further added U.S. Pub. Pat. App. 2001/0011304 (hereinafter "Wesinger") to the list of cited art without specifying a specific ground of rejection.

F.   RCE Preliminary Amendment (Filed April 20, 2006)

In this response (hereinafter "RCE Amendment"), Applicant submitted a request for continued examination (RCE), re-submitted the Final OA Response, re-submitted the Inventor Affidavit, requested an element-by-element analysis of at least the independent claims showing where each claimed element can be found in the cited art, requested an Examiner Interview (specifically requesting the attendance of the Supervisory Examiner for the case), and presented additional arguments without amending the claims further. The remarks and arguments presented further explained and expanded upon the remarks and arguments of the Final OA Response with regard to Bugnion, Derks, Bowman-Amuah and Devine, explained why Wesinger did not support a rejection of the claims, and noted the significance of the Inventor Affidavit. Applicant also expressed concern that despite repeated attempts at explaining the basic concept of a virtual machine, the Examiner failed to understand this concept, and as a result had continued to cite art that was not relevant and that failed to support the rejections made.

G.   First Office Action after RCE (Mailed June 28, 2006)

In this Office Action (hereinafter "First RCE Office Action"), the Examiner accepted the Inventor Affidavit and stated that said Inventor Affidavit was sufficient to overcome Bugnion, Derks, Bowman-Amuah and/or Devine.   The Examiner further: 1) rejected claims 37-53 under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter; 2) rejected claims 1-36 and 54-61 under 35 U.S.C. § 102(e) as allegedly anticipated by Wesinger; and 3) rejected claims 37-53 and 62-64 under 35 U.S.C. § 103(a) as allegedly obvious over Wesinger in view of U.S. Pat. No. 5,357,612 (hereinafter "Alaiwan").

H.   Response to First RCE Office Action (Filed September 5, 2006)

In this response (hereinafter "First RCE OA Response"), Applicant amended independent claims 1, 20, 37 and 54.   Applicant noted that the virtual servers taught by Wesinger do not run separate operating systems, as required by the amended claims, and are thus not virtual machines.   Applicant further noted that Alaiwan discloses real processors and does not discuss or relate at all to virtual machine technology, and thus the combination of Wesinger and Alaiwan, even if suggested, would not produce the claimed invention.   Applicant also noted that the newly cited art, like the previously cited art, does not teach using virtual machines on a real computer to provide computer services to plural customers in which each virtual machine for each of the customers has a specification specified by and configurable by the respective customer.

I.   Final Office Action after RCE (Mailed November 13, 2006)

In this Office Action (hereinafter "Final RCE Office Action"), the Examiner withdrew the § 101 rejection of the First RCE Office Action, and rejected claims 1-64 under 35 U.S.C. § 102(e) as allegedly anticipated by Wesinger, stating that the rejections of the claims were based upon new grounds. The Examiner further

made reference to U.S. Pat. No. 6,434,594 (hereinafter "Wesemann"), a Cisco News Release (hereinafter "Cisco"), and a Seagate News Release (hereinafter "Seagate") as extrinsic evidence of inherency and the state of the art.

J.   Examiner Interview (January 9, 2007)

A telephonic interview (hereinafter "First Interview") took place that included the Examiner and Applicant's attorney (Daniel Krueger), but did not include the Supervisory Examiner for the case, as previously requested by Applicant in the RCE Amendment. Applicant discussed the general subject matter of the subject application, as well as distinctions between claim 1 and the cited art.

K.   Response to Final RCE Office Action (Filed January 12, 2007)

In this response (hereinafter "Final RCE OA Response"), Applicant requested reconsideration of the rejections and discussed the subject matter of both Wesinger and Wesemann. Applicant argued that the Examiner's citations of Wesemann failed to establish that the "virtual machine" of Wesinger is a virtual machine as required by the claims of the subject application.

L.   Advisory Action (Mailed February 6, 2007)

In this advisory action (hereinafter "Second Advisory Action"), the Examiner indicated that the request for reconsideration presented in the Final RCE OA Response had been considered but did not place the application in condition for allowance. The Examiner reiterated her previously presented assertion that the virtual hosts taught by Wesinger are virtual machines.

M.   Pre-Brief Conference Request (Filed March 8, 2007)

Applicant submitted a Pre-Appeal Brief Conference Request (hereinafter "Pre-Brief Request"), reiterating that Wesinger does not teach a virtual machine in the sense required by the claims of the subject application.   Applicant further argued that the Examiner failed to properly support her assertions of inherency with regard to Wesemann as applied to Wesinger.

N.   Pre-Brief Conference Decision (Mailed March 21, 2007)

A pre-brief conference decision was reached, withdrawing the previous rejection and re-opening prosecution of the subject application.

O.   Examiner Interview (June 26, 2007)

In response to several telephonic requests by Applicant's attorneys, an Examiner interview (hereinafter "Second Interview") was conducted that included the Examiner and Applicant's attorneys (Jonathan Pierce and Roberto de Leon). The Supervisory Examiner was not in attendance, despite the request by Applicant's attorneys for the Supervisory Examiner to be in attendance and despite the fact that the Supervisory Examiner had previously indicated he would be available and that the Second Interview was specifically arranged so that the Supervisory Examiner would be able to attend.   Applicant's attorneys again addressed what they perceived was a misunderstanding as to what one of ordinary skill in the art would understand to be a virtual machine.   Applicant's attorneys then pointed out specific references in Wesinger clearly showing that the virtual hosts of Wesinger are not and cannot be virtual machines, and that the virtual hosts of Wesinger do not and cannot run or support running a separate operating system. As noted in the Interview summary submitted on July 5, 2007, the Examiner requested that the arguments be formally filed for consideration.

P.   Examiner Interview (June 28, 2007)

In response to a telephonic request by Applicant's attorneys to the Supervisory Examiner in this case, another Examiner interview (hereinafter "Third Interview") was conducted that included the Examiner, the Supervisory Examiner and Applicant's attorneys (Jonathan Pierce and Roberto de Leon). Applicant again re-presented the arguments previously presented during the Second Interview and in previous responses to office actions, after which the Supervisory Examiner indicated that he would not have cited Wesinger against the subject application. The Supervisory Examiner then brought U.S. Pat. No. 5,511,217 (hereinafter "Nakajima") to the attention of Applicant's attorneys, noting that Applicant's attorneys should review it and address it in the response to the Current Office Action.

II.   THE CURRENT OFFICE ACTION AND RESPONSE TO CURRENT OFFICE ACTION

In the Current Office Action, the Examiner rejected independent claims 1 and 20 under 35 U.S.C. § 103(a) as obvious over Wesinger in view of Rogers. The Examiner stated that Wesinger teaches, among other things, "at least one virtual machine (fig. 1 *virtual host 1, 2, ... N*) for each of said customers...." Current Office Action, ¶ 3, p. 3. Applicant respectfully traverses the Examiner's characterization of the cited art. Wesinger teaches a web server that "although it runs on a single physical machine 100, appears on the Web as multiple virtual hosts VH1 through VHn." Wesinger, ¶ [0023]. Wesinger further teaches that "the Web server 'forks a copy' of itself, using the forking capabilities of UNIX, to create a virtual host VHn," and that "[w]hen a parent process is forked to create a child process, the child process runs off the same base code as the parent process but using its own set of variables." Wesinger, ¶ [0026]. Thus, the virtual hosts taught by Wesinger are simply execution threads of a single base code image of the Web server described, and thus are only capable of performing those tasks that

the Web server is capable of performing. As one of ordinary skill in the art will recognize, a Web server is not capable of "having a separate operating system running thereon," as required by independent claims 1 and 20, and is not a virtual machine. Wesinger thus does not teach or even suggest such a claim element.

Further, Rogers does not overcome the deficiencies of Wesinger. Applicant respectfully notes that Rogers does not even mention virtual machines. The passage cited by the Examiner only references in passing IBM's MVS operating system, which is described as "IBM's operating system which enables multiple kinds of operating systems, including 'UNIX' to co-exist on a single platform." Rogers, col. 6, lines 42-44. Applicant respectfully notes that the fact that Rogers states that several operating systems can "co-exist" on a platform does not necessarily imply that they are executing concurrently or that each operating system executes on a virtual machine. One of ordinary skill in the art would recognize that while "having a separate operating system running thereon" is a necessary element of a virtual machine, it is not a sufficient element, in and of itself. Moreover, Rogers does not mention the setting up of multiple virtual machines for multiple customers, configured and specified by each of said customers. Furthermore, as is well known to those skilled in this art, IBM's MVS system specifically referred to by Rogers was an operating system that used so-called Multiple Virtual Storage to allow plural computer tasks each to run in the same physical memory in a computer as though they had exclusive access to the real physical memory. As is well known to those skilled in this art, this is not the same as creating or running plural virtual machines, each with its own separate operating system, on a real computer.

At least because both Wesinger and Rogers fail to teach or even suggest, either alone or in combination, "at least one virtual machine… having a separate operating system running thereon" as required by both independent claim 1 and independent claim 20, Applicant respectfully submit that these claims, as well as those claims that respectively depend upon them, are all in condition for allowance.

Regarding independent claim 54, the Examiner rejected the claim under 35 U.S.C. § 103(a) as allegedly obvious over Wesinger in view of Stewart. Applicant respectfully traverses the Examiner's rejection of this claim for at least the same reasons as with regard to independent claims 1 and 20. As already noted, Wesinger does not teach or even suggest "at least one virtual machine having a separate operating system running thereon," a requirement of independent claim 54. Stewart does not overcome this deficiency, and does not even mention virtual machines. Stewart is directed towards profiling software used to characterize the performance of software running under one of a variety of operating systems, and goes on to describe how the PEEK tool operates, that is first by modifying the executable code of an application program in order to collect profiling data, and secondly by enabling analysis and interpretation of the results. The abstract cited by the Examiner describes the product as "engineered to support multiple operating systems that run on PowerPC processors, including the AIX™, Mac™ OS, and Windows NT™ operating systems." Stewart, abstract. Applicant respectfully points out that, as with the Web server of Wesinger, one of ordinary skill in the art will recognize that a profiler application program is not capable of "having a separate operating system running thereon." The reference to the term "support" refers to the profiler program's ability to be compiled to execute on one of the listed operating systems and extract performance information related to a program executing under one of the listed operating systems. Applicant respectfully submits that Stewart is thus non-analogous art with no relevance to the subject application. Applicant thus respectfully submits that neither Wesinger nor Stewart, either alone or in combinations, teach or even suggest all of the limitations of independent claim 54. For at least these reasons, Applicant respectfully submits that independent claim 54, and all claims that depend upon it, are in condition for allowance.

Regarding independent claim 37, which the Examiner rejected under 35 U.S.C. § 103(a) as allegedly anticipated over Wesinger in view of Doran, Applicant also respectfully traverses the Examiner's characterization of the cited

art, noting that Doran, like other cited art previously overcome (*e.g.*, Bugnion, as noted above), merely teaches virtual machines and virtual machine monitor software, and more efficient and effective internal structures of such software and its interaction with hardware. Although Doran mentions the word "Customer", it is plain to see that the reference is to customers each of whom has purchased from Amdahl a real mainframe computer, and does not refer to nor imply apparatus providing one or more computer services for a plurality of customers . Moreover, independent claim 37 requires more than this, specifically, plural virtual machines "having a specification specified by and configurable by a respective one of the customers in accordance with a computer service to be provided by the virtual machine on behalf of that customer." Moreover, claims 1 and 20 recite "having a specification specified by and configurable by the respective customer and having a separate operating system running thereon," while claim 54 recites "having a specification determined in accordance with the computer service or services requested by said customer and being configurable by said customer." *These claim limitations are not taught or even suggested by Wesinger, Doran, or any of the art cited during the entire 2½ years of prosecution of the application.* Thus, Applicant respectfully submits that, for at least these reasons, independent claims 1, 20, 37 and 54, as well as those claims that depend respectively on each independent claim, are all in condition for allowance.

III.   NAKAJIMA REFERENCE AND ADDITIONAL CONCERNS

Although not presented in the Current Office Action, the Nakajima reference was brought to the attention of Applicant's attorneys during the Third Interview. However, Nakajima describes a virtual machine monitor capable of dealing with issues related to sharing vector processor resources within a supercomputer between virtual machines executing over a scalar processor. Applicant's invention is distinguished from Nakajima in *precisely the same way as from Bugnion*, in that Nakajima relates purely to more efficient and effective

internal structures of virtual machines and virtual machine monitors. More specifically, Nakajima, like the references previously cited, fails to teach or disclose: (a) "Apparatus providing one or more computer services for a plurality of customers, the apparatus comprising a real computer on which is set up at the request of said customers at least one virtual machine for each of said customers, said at least one virtual machine for each of said customers having a specification specified by and configurable by the respective customer and having a separate operating system running thereon." as required by claim 1; (b) "A method of providing one or more computer services for a plurality of customers, the method comprising the steps of a service provider setting up on a real computer at the request of each of said customers at least one virtual machine for each of said customers, said at least one virtual machine for each of said customers having a specification specified by and configurable by the respective customer and having a separate operating system running thereon." as required by claim 20; (c) "A method of operating a real computer on behalf of plural customers, the method comprising operating plural virtual machines on the real computer, each of said plural virtual machines having a specification specified by and configurable by a respective one of the customers in accordance with a computer service to be provided by the virtual machine on behalf of that customer, each of said virtual machines having a separate operating system running thereon, so as to provide respective computer services to the respective customers." as required by claim 37; or (d) "A method of providing for a plurality of customers one or more computer services selected from: file, data and archiving services; applications hosting services; database hosting services; data warehouse services; knowledge management hosting services; digital media production services; 'intellectual property' and streaming media services; simple web hosting services; complex e-Commerce web hosting services; high performance computation services; electronic messaging and conferencing services; and, learning neuro-computer services; the method comprising the steps of: setting up on a real computer at the request of each of said customers at least one virtual machine for

each of said customers, said at least one virtual machine for each of said customers having a specification determined in accordance with the computer service or services requested by said customer and being configurable by said customer, said at least one virtual machine having a separate operating system running thereon." as required by claim 54. Therefore, for at least these reasons, the Nakajima reference does not affect the patentability of the pending claims.

Applicant respectfully notes, for the record, a real and growing concern over the protracted and unduly long prosecution of the subject application. Applicant respectfully points out that since the First Office Action of December 2004, seven written responses have been submitted, three Examiner interviews have been conducted, and an Appeal was filed with a Pre-Appeal Brief Conference Request. During that time, Applicant has only amended the claims twice, and has not substantively changed the essence of the arguments presented in favor of the patentability of the claimed invention over the cited art. Applicant also respectfully notes a recent trend, or at least a perceived trend, of a repetition of similar cited art (*e.g.*, Bugnion and Nakajima), further exacerbating Applicant's concern over the length of the prosecution of the subject application.

Applicant further notes concern over the complete lack of relevance of some of the cited art (*e.g.*, virtual memory, virtual servers, virtual private networks and profiling software), which would seem to indicate a misunderstanding of at least some of the foundational concepts of the background and underlying technology of the claimed invention. Applicant notes that no disrespect towards the Examiner is intended by these comments. Applicant instead merely has presented them as a premise for respectfully suggesting that the prosecution of the subject application would be well-served if the Examiner was to seek additional assistance from other Office personnel with greater specific knowledge and experience regarding virtual machine technologies.

Applicant also respectfully notes that under MPEP § 707.02:

> The supervisory patent examiners are expected to personally check
> on the pendency of every application which is up for the third or

subsequent Office action with a view to finally concluding its prosecution.

Any application that has been pending five years should be carefully studied by the supervisory patent examiner and every effort should be made to terminate its prosecution. In order to accomplish this result, the application is to be considered "special" by the examiner.

Applicant respectfully submits that a more direct involvement by the Supervisory Examiner in this case would benefit the prosecution of the subject application, would avoid further undue expense and hardship on the part of the Applicant, and would further the goals of the cited MPEP section. Applicant respectfully requests consideration by the Examiner and the Supervisory Examiner of the above-described suggestions.

IV. CONCLUSION

Applicant respectfully submits that for at least the reasons presented above, all claims are in condition for allowance. In the course of the foregoing discussions, Applicant may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the cited art which have yet to be raised, but which may be raised in the future.

Applicant respectfully requests reconsideration and that a timely Notice of Allowance be issued in this case. It is believed that no extensions of time or fees are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are

hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required (including fees for net addition of claims) are hereby authorized to be charged to Conley Rose, P.C.'s Deposit Account No. 03-2769/1821-01100.

Respectfully submitted,

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